
GLOSSARY AND ACRONYMS

AF - acre-feet

AFA - acre-feet per acre

Beneficial use - a set of uses of water which are deemed by law to provide legitimate basis for a water right.

Best management practices - the state-of-the-art practices that are efficient and effective, practical, economical, and environmentally sound to minimize soil erosion.

BLM - U.S. Department of Interior, Bureau of Land Management

Board - the Idaho Water Resources Board (IWRB).

BPA - U. S. Department of Energy, Bonneville Power Administration

CDC - Idaho Department of Fish and Game, Conservation Data Center

cfs - cubic feet per second, a unit of measure for the rate of discharge of water. One cubic foot per second is the rate of flow of a stream with a cross section of one square foot which is flowing at a mean velocity of one foot per second. It is equal to 448.8 gallons per minute, or 1.98 acre-foot per day.

CoE - U. S. Army Corps of Engineers

Comprehensive state water plan - the plan adopted by the Board pursuant to section 43-1734A, Idaho Code, or a component of such plan developed for a particular water resource, waterway or waterways and approved by the Idaho Legislature.

Confluence - the flowing together of two or more bodies of water.

Conservation - increasing the efficiency of energy and water use, production, or distribution.

Consumptive use - the amount of water that actually is consumed during its application to beneficial use and is removed from the stream system.

Culinary supply - water meeting all applicable safe drinking water requirements suitable for residential and commercial use.

DCMI - Domestic, commercial, municipal and industrial uses.

Domestic - water used for residential household purposes and residential lawn and garden watering. Municipal irrigation of parks and golf courses is included here.

Commercial - water used by hotels, motels, restaurants, office buildings, retail sales stores, educational institutions, churches, hospitals, and government and military facilities.

Municipal - consists of the sum of "residential" and "commercial" uses, which are not usually identified separately in available records of water use.

Industrial - water used to manufacture products. Places of industrial use include meat packing, dairies, cheese factories, other food processing enterprises, gravel washing, and ready-mix concrete operations.

DEQ - Idaho Department of Health and Welfare, Division of Environmental Quality

Ecosystem - a complex system composed of a community of flora and fauna taking into account the chemical and physical environment with which the system is interrelated.

Endangered Species Act - Section 7 of this federal statute, (16 U.S.C. §1536), requires that the government take no action which may jeopardize the continued existence of any endangered or threatened species or adversely modify its critical habitat. Where the federal government is involved in a water project (either by building it or issuing a permit or license), the Endangered Species Act may prohibit the government from proceeding if the loss of water will be harmful to such species.

Endangered species - any species which, as determined by the U.S. Fish and Wildlife Service or National Marine Fisheries Service, is in danger of extinction throughout all or a significant portion of its range.

EPA - Environmental Protection Agency

FERC - Federal Energy Regulatory Commission established in 1977 (replacing the Federal Power Commission) with the primary responsibility of ensuring the Nation's consumers adequate energy supplies at just and reasonable rates and providing regulatory incentives for increased productivity, efficiency, and competition. Its primary functions are to establish and enforce rates and regulations regarding interstate aspects of the electric, natural gas, and oil industries. It also issues licenses for non-Federal hydroelectric plants and certifies small power production and cogeneration facilities.

Floodplain - the land that may be submerged by floodwaters. The plain built up by stream deposition. The 100-year floodplain identifies the land in the floodplain subject to a 1 percent or greater chance of flooding in any given year.

Floodway - the channel of the stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

Habitat - the place or type of natural site where a plant or animal normally lives and grows.

Head - the elevational difference between the surfaces of water; usually upstream and

downstream of a turbine or pump. The differential of pressure causing flow in a fluid system, usually expressed in terms of the height of a liquid column that the pressure will support.

Highwater mark (line) - the line that separates the aquatic vegetation from terrestrial vegetation.

Hydropower project - any development which uses a flow of water as a source of electrical or mechanical power, or which regulates the flow of water for the purpose of generating electrical or mechanical power. A hydropower project development includes all powerhouses, dams, water conduits, transmission lines, water impoundments, roads, and other appurtenant works and structures.

Idaho Code - the Idaho laws, in this case those pertaining to water issues.

IDFG - Idaho Department of Fish and Game

IDWR - Idaho Department of Water Resources

IOGLB - Idaho Outfitters and Guides Licensing Board

Irrigation - water used for irrigation of cropland. Residential lawn and garden uses are not included.

IWRB - Idaho Water Resource Board

kwh - Kilowatt- hour - unit of energy equal to that expended by one kilowatt in one hour.

Kilowatt (kw) - unit of electric power equal to 1,000 watts, or about 1.34 horsepower.

Lava plain - a broad stretch of nearly level to gently undulating surface underlain by basaltic flows.

Loam - moderately coarse, medium and moderately fine-textured soils that include such textural classes as sandy loam, fine sandy loam, very fine sandy loam, silt loam, silt, clay loam, sandy clay loam and silty clay loam.

Main stem - the main channel of a river, in this plan it is referring to the South Fork Snake River.

Megawatt (MW) - unit of electrical power equal to 1,000,000 watts, or about 1,340 horsepower.

Minimum stream (instream) flow - the water that is not diverted and used but rather remains for wildlife habitat, recreation, navigation, and aesthetic beauty.

Natural River - a waterway which possesses outstanding fish and wildlife, recreation, geologic or scenic values, which is free of substantial existing man-made impoundments, dams or other structures, and of which the riparian areas are largely undeveloped, although accessible in places by trails and roads.

NWPPC - Northwest Power Planning Council

Placer or dredge mining - any dredge or other operation to recover minerals with the use of a dredge boat or sluice washing plant whether fed by bucket line or separate dragline or any other method. This could include, but is not limited to, suction dredges which are capable of moving more than 2 cubic yards per hour of surficial material.

Plain - a region of general uniform slope, comparatively level, of considerable extent, and not broken by marked elevations and depression.

PNRBC - Pacific Northwest River Basins Commission

Preliminary permit - a FERC authorization granting priority right to file a license application, and authorizing the permittee to conduct studies and analyses necessary to prepare a complete license application. A preliminary permit does not permit any construction.

Private, Domestic, and Stock - water used from private wells or springs for individual homes, usually in rural areas not accessible to public water supply systems.

Public interest - something that impacts the majority of the people, usually beneficially.

Public water supply - water supplied to either private or publicly owned community systems which serve at least 15 service connections or 25 individuals at least 60 days per year. Water from public supplies is used for residential, commercial, and industrial purposes, including irrigation of publicly owned areas.

Ramp rate - the maximum allowable rate of change in output from a power plant. The ramp rate is established to prevent undesirable effects due to rapid changes in loading, or in the case of hydroelectric plants, discharge.

Recreational dredge mining - dredge mining in which the nozzle is 5 inches or less, and moves less than 2 cubic yards per hour.

Recreational River - a waterway which possesses outstanding fish and wildlife, recreation, geologic or scenic values, and which might include some man-made development within the waterway or within the riparian area of the waterway.

Riparian - living on or adjacent to a water supply such as a riverbank, lake, or pond; that area within 100 feet of the mean highwater mark of a waterway.

River basin - the total drainage or catchment area of a stream (i.e., the watershed).

Riparian vegetation - vegetation that is associated with aquatic (streams, rivers, lakes) habitats.

RVD - Recreational Visitor Days. One RVD is equivalent to one person spending 12 hours at a particular activity.

SAWQP - State Agricultural Water Quality Plan

SCS - U.S. Department of Agriculture, Soil Conservation Service. This agency reorganized and changed its name to the Natural Resource Conservation Service (NRCS) in 1994.

Secondary systems - pressurized lawn and garden irrigation systems using untreated water for irrigation of lawns, gardens, and publicly owned open areas.

Threatened species - a species, determined by the U.S. Fish and Wildlife Service or National Marine Fisheries Service, which are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

TMDL - Total Maximum Daily Load. Total maximum daily load is the sum of all pollutants in a waterway. Pollutant levels established through TMDL standards must be at or below the level established for the waterway to abide by water quality standards.

Turbidity - a measure of the extent to which light passing through water is reduced due to suspended materials. Excessive turbidity may interfere with light penetration and minimize photosynthesis, thereby causing a decrease in primary productivity. It may alter water temperature and interfere directly with essential physiological functions of fish and other aquatic organisms, making it difficult for fish to locate a food source.

USBR - U.S. Department of Interior, Bureau of Reclamation

USGS - U. S. Geological Survey

Vested rights - those rights that are fixed and not contingent upon any future actions; for example, mining claims or a water right. A protected river designation cannot interfere with vested property rights made prior to the designation.

Water table - the highest part of the soil or underlying rock material that is wholly saturated with water. On some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Waterway - a river, stream, creek, lake or spring, or a portion thereof.

Wetlands - lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water. Wetlands must have the following three attributes: (1) at least periodically, the land supports predominately hydrophytes; (2) the substrate is predominately undrained hydric soil; and (3) the substrate is on soil and is saturated with water or covered by shallow water at some time during the growing season of each year.



REFERENCES

- Alt, D. A. and D. W. Hyndman. 1989. *Roadside Geology of Idaho*. Missoula, MT: Mountain Press Publishing Co.
- Aslett, K. 1982. Raw Vegetation Sample Data of South Fork Snake.
- Barker, B., Utah Power & Light. 1996. Personal Communication.
- Beal, M. D. 1942. *History of Southeastern Idaho*. Caldwell, ID: The Caxton Printers, Ltd.
- Behnke, R. J. 1992. Native Trout of Western North America. American Fisheries Society Monograph 6. Bethesda, MD.
- Beus, M., Lead Hydrologic Engineer, U. S. Bureau of Reclamation. 1996. Personal Communication.
- Bonneville County Commissioners. 1995. Bonneville County Comprehensive Land Use Plan.
- Brockway, C. E., and J. de Sonnevile. 1973. Systems Analysis of Irrigation Water Management in Eastern Idaho. Research Technical Completion Report Project B-018-IDA. Moscow, ID: Water Resources Research Institute.
- Brown, W., Outdoor Recreation Planner, Idaho Falls District, Bureau of Land Management. 1995 and 1996. Personal Communications.
- Butler, B. R. 1958. Archaeological Survey of the Burns Creek Reservoir, Idaho.
- _____. 1986. Prehistory of the Snake and Salmon River Area. In Sturtevant, W.C. and Warren L. D'Azevedo (eds.), *Handbook of North American Indians, Great Basin Volume*. Washington, D.C.: Smithsonian Institution.
- Carter, K. B. (editor). 1955. *Pioneer Irrigation, Upper Snake River Valley*. Utah Printing Co.
- Case, B., Lower Valley Power and Light. 1996. Personal Communication
- Clements, L. J. 1974. *A History of the Upper Snake River Area to 1840*. Rexburg, ID: Eastern Idaho Publishing Company.
- Cochnauer T. and R. White. 1975. Stream Resource Maintenance Flow Studies. IDFG. 136 pp.
- Crockett, J., Ground Water Hydrogeologist, Idaho Department of Water Resources. 1996. Personal Communication.
- Daniels, Y., U.S. Bureau of Reclamation. 1995. Personal Communication.
- Dean, G. 1995a. Unpublished Data for the Targhee National Forest.
- Dean, G., Biologist, Targhee National Forest. 1995b. Personal Communication.
- DeGraff, R. M., V. E. Scott, R. H. Hamre, L. Ernst, and S. H. Anderson. 1991. Forest and Rangeland Birds of the United States, Natural History and Habitat Use. Agriculture Handbook. U. S. Department of Agriculture, Forest Service.
- Drewes, B. 1991. Antelope - Pine Creek Area, Water Quality Status Report No. 99. IDHW/DEQ State Agriculture Water Quality Planning (SAWQP) Study.
- Duff, D. A., editor. 1996. Conservation Assessment for Inland Cutthroat Trout Status and Distribution. Ogden, Utah: USDA, Forest Service, Intermountain Region.

Dunn, D., Eastern Region, Idaho Department of Water Resources. 1996. Personal Communication.

Federal Emergency Management Agency. 1981. Flood Insurance Study - Bonneville County, Idaho Unincorporated Areas.

_____. 1988. Flood Insurance Study - Jefferson County, Idaho and Unincorporated Areas.

Federal Energy Regulatory Commission (FERC). 1990. Final Environmental Impact Statement - Milner, Twin Falls, Auger Falls, and Star Falls Hydroelectric Projects.

Frest, T. R. 1994. Southern Idaho Springsnail Sites. Data Records from Deixis Consultants. Seattle, WA. 46 pps.

Frest, T. R. and E. J. Johannes. 1995. Interior Columbia Basin Mollusk Species of Special Concern. Prepared for Interior Columbia Basin Ecosystem Management Project. Walla Walla, WA. 274 pps. and appendices.

Gardetto, J., Wildlife Biologist, Idaho Falls District, Bureau of Land Management. 1996. Personal Communication.

Goodell, S.A. 1988. Water Use on the Snake River Plain, Idaho and Eastern Oregon. U.S. Geological Survey Professional Paper 1408-E. Washington, D.C.

Gillerman, V., Idaho Geological Survey. 1995. Personal Communication.

Greater Yellowstone Ecosystem Working Team. 1983. A Bald Eagle Management Plan for the Greater Yellowstone Ecosystem. Wyoming Game and Fish Department. 84 pps.

Griswold, R.G. 1991. Winter Habitat Availability and Utilization by Juvenile Cutthroat Trout, Brown Trout, and Mountain Whitefish in the South Fork of the Snake River, Idaho. Idaho Department of Fish and Game. Project No. 0-AG-10-10920. 29 pps.

Hall, I., City of Ririe. 1996. Personal Communication.

Hayden, J. A. 1989. Status and Population Dynamics of Mountain Goats in the Snake River Range, Idaho. MS Thesis. Missoula, MT: University of Montana.

Horsburgh, G. 1992. Oil and Gas Potential Report. Prepared for the Targhee National Forest.

Horsburgh, G., Geologist, Idaho Falls District, Bureau of Land Management. 1995. Personal Communication.

Hunt, J.D., N. Sanyal, J. Vlaming, and S. R. Leidner. 1994. Regional Analysis of Nonresident Motor Vehicle Travel in Idaho: Region 6. #753 Idaho Forest, Wildlife and Range Experiment Station Report. Moscow, ID: University of Idaho.

Idaho Bureau of Mining and Geology. 1981. Mines and Prospects of the Driggs Quadrangle. Moscow, ID.

Idaho Department of Commerce, Economic Development Division. 1994. County Profiles of Idaho.

Idaho Department of Employment. 1994. Idaho Demographic Profile-Projections for 1994.

_____. 1995a. Idaho Demographic Profile-Projections for 1995.

_____. 1995b. Idaho Falls Job Service Economic Profile. March 1995.

Idaho Department of Fish and Game. 1979. A Summary of Goose Nest Studies on the South Fork Snake River 1972-1979. IDFG Unpublished Report.

_____. 1991. Fisheries Management Plan 1990-1995.

_____. 1995a. Opinion Survey of Idaho Anglers.

_____. 1996. Fisheries Management Plan 1996-2000.

_____. Conservation Data Center (CDC). 1994. Rare, Threatened, and Endangered Plants and Animals in Idaho.

_____. Conservation Data Center. 1996. CDC Database.

Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ). 1992. The 1992 Idaho Water Quality Status Report.

_____. 1994. State of Idaho Public Drinking Water System Inventory Database. Boise, ID: Idaho Department of Health and Welfare, DEQ.

_____. 1995. Eastern Idaho Reservoir Drawdown Monitoring Results. Water Quality Status Report. Idaho Department of Health and Welfare, Division of Environmental Quality, Eastern Idaho Regional Office.

Idaho Department of Lands. 1986. Operations Memorandum 1700, Navigable Waters in Idaho.

Idaho Department of Water Resources (IDWR). 1978. Bonneville County, Jefferson County, and Madison County, Idaho: Water-Related Land Use - 1975. Boise, ID.

_____. 1994. Idaho Energy Vital Statistics.

_____. 1995a. Water Master Reports for 1990, Water Right and Adjudication Files, and Tributary Basins Hydrologic Summary Notebook. Unpublished files and records.

_____. 1995b. Federal Energy Regulatory Commission (FERC) Database.

_____. 1996. Monthly Hydrologic Database.

Idaho Outfitters and Guides Licensing Board (IOGLB). 1995. Data Files.

Idaho Power Company. 1994. County Economic Forecast.

Idaho State Historical Society. 1996. Archaeological Survey of Idaho Files.

Idaho Water Resource Board (IWRB). 1968. Idaho Water Resources Inventory. Moscow, ID: Water Resources. Research Institute, University of Idaho.

_____. 1992. Idaho State Water Plan.

Idaho Water Resource Research Institute. 1979. Inventory of Offstream Reservoir Sites in the Upper Snake River Basin.

Jefferson County Planning Commission. 1988. Jefferson County, Idaho - Comprehensive Plan.

Johnson, J. L. And R. D. Pfister. 1982. A Survey of Potential Ecological Natural Landmarks of the Middle Rocky Mountains. Prepared for the U.S. Dept. Of Interior, National Park Service. Ogden, UT: Intermountain Forest and Range Station.

Jones, J., Caribou National Forest. 1996. Personal Communication.

Kilpatrick, C. 1987. Peregrine Falcon Habitat and Potential Reintroduction Site Survey of the Sandpoint Ranger District of the Idaho Panhandle National Forests. U. S. Department of Agriculture, Forest Service Contract No. 53-0281-7-127.

Kjelstrom, L. C. 1992. Streamflow Gains and Losses in the Snake River and Ground-Water Budgets for the Snake River Plain, Idaho and Eastern Oregon. U. S. Geological Survey Open-File Report 90-172. Boise, ID.

Kotansky, D., Hydrologist, Idaho Falls District, Bureau of Land Management. 1996. Personal Communication.

Kremer, Brian, Flood Control District #1 Commissioner. 1993. Personal Communication.

Krohn, W. B. And E. G. Bizeau. 1980. The Rocky Mountain Population of the Western Canada Goose: Its Distribution, Habitats and Management. Special Scientific Report, Wildlife No. 229. Washington D.C.: U. S. Department of Interior, Fish and Wildlife Service.

Kuck, L. 1992, 1993 and 1994. Summary of Big Game Harvest Estimates. Idaho Department of Fish and Game.

Layser. 1994. Unpublished Forest Service Data.

Liljeblad, S. 1957. Indian Peoples in Idaho. Pocatello, ID: Idaho Museum of Natural History.

Mackenthun, K. M. 1973. Towards a Cleaner Aquatic Environment. Washington, D.C.: U. S. Environmental Protection Agency.

Martin, Bob, Environmental Coordinator, Eastern Region, Idaho Department of Fish and Game. 1996. Personal Communication.

Martin, R.C. and H.J. Hansen. 1992. Palisades Wildlife Mitigation South Fork Snake River Programmatic Management Plan Implementation Phase I - Final Report. Project No. 91-063. Prepared for U. S. Department of Energy, BPA, Division of Fish and Wildlife. Portland, Oregon. 31 pps.

McDonald, J. A. 1983. Targhee National Forest Cultural Resources Overview - Version 3.

Merigliano, M.F. 1994. A Natural History of the South Fork Snake River, Eastern Idaho, Emphasizing Geomorphology, Hydrology, and Vegetation. MS Thesis. Missoula, MT: University of Montana. 278 pps.

Merigliano, M.F. 1996. Ecology and Management of South Fork Snake River Cottonwood Forest. Technical Bulletin 96-9. Boise, ID: Bureau of Land Management. 79 pps.

Merigliano, M.F., Research Assistant, School of Forestry, University of Montana. 1995. Personal Communication.

Meuleman, G.A., R.C. Martin, and H.J. Hansen. 1986. Wildlife Protection, Mitigation, and Enhancement Plan - Palisades Project. Project No. 86-73. U.S. Depart. of Energy, BPA, Division of Fish & Wildlife and IDFG. 95 pps.

Milligan, J.H., R.A. Lyman, C.M. Falter, E.E. Krumpe, and J.E. Carlson. 1983. Classification of Idaho's Freshwater Lakes. Idaho Water and Energy Resources Research Institute for Idaho Department of Health and Welfare, Division of Environmental Quality.

Moe, M., Timber Supervisor, Soda Springs District, Caribou National Forest. 1996. Personal Communication.

Molnau, M., State Climatologist. 1993. Annual Precipitation for Idaho.

Moore, V. 1980. Subproject IV: River and Stream Investigations, Project F-73-R-2. Idaho Department of Fish and Game.

Moore, V., K. Aslett, and C. Corsi. 1981. River and Stream Investigations - Palisades Reservoir Creel Census and Palisades River Tributary Evaluation. Project No. F-73-R-3. IDFG. 141 pps.

Moore, V. and D. Schill. 1984. Subproject IV: River and Stream Investigations, Project No. F-73-R-5, Study VII: South Fork Snake River Fisheries Investigations, Job 3: Fish Distribution and Abundance in South Fork Snake River. Idaho Department of Fish and Game. 133 pps.

Moseley, R., Botanist, Conservation Data Center, Idaho Department of Fish and Game. 1996. Personal Communication.

Mundorff, M.J., E.G. Crosthwaite, and C. Kilburn. 1960. Ground Water for Irrigation in the Snake River Basin in Idaho, Upper Snake River Basin, Volume III, Part 2. Boise, ID and Walla Walla, WA: U.S. Bureau of Reclamation and Corps of Engineers.

Naderman, J, Wildlife Biologist, Idaho Department of Fish and Game. 1994. Personal Communication.

Nelson, L. 1990 and 1991. Summary of Big Game Harvest Estimates. Idaho Department of Fish and Game.

Ondrechen, Bill, Hydrologist, Idaho Department of Water Resources. 1996. Personal Communication.

Pacific Northwest River Basins Commission (PNRBC). 1970. Columbia-North Pacific Region Comprehensive Framework Study: Appendix V, Water Resources. Vancouver, WA.

Paige, C., B. Madden, and B. Ruediger. 1990. Bald Eagles of the Upper Columbia Basin: Timber Management Guidelines. U. S. Department of Agriculture, Forest Service.

Parrish, J., N. Sanyal and J.D. Hunt. 1996. 1994 -1995 Idaho Resident Recreation & Travel. Contribution #808 of the Idaho Forest, Wildlife and Range Experiment Station. Moscow, ID: University of Idaho.

Parker, T. 1973. South Fork Canada Goose Study. IDFG Report. 31 pps.

Pero, T.R. and J.A. Yuskavitch (editors). 1989. America's 100 Best Trout Streams. *Trout*. Vol. 30, No.2, pps. 8-13.

Perry, J., M. McSorley, and B. Campbell. 1977. Water Quality Status Report, Upper Snake River (Lake Walcott to Idaho-Wyoming Border). Idaho Department of Health and Welfare, Division of Environment.

Poccard, B. 1980. Important Fish and Wildlife Habitats of Idaho. Unpublished manuscript. Boise, ID: U.S. Fish and Wildlife Service, Oregon-Idaho Area Office.

Ragotzkie, K., Wildlife Mitigation Specialist, Idaho Department of Fish and Game. 1996. Personal Communication.

Reece, K., Energy Bureau, Idaho Department of Water Resources. 1996. Personal Communication.

Reid, W. 1989. A Survey of 1987 Idaho Angler Preferences. Job Completion Report F-35-R-13. Idaho Department of Fish and Game.

Reynolds, R. T. 1983. Management of Western Coniferous Forest Habitat for Nesting Accipiter Hawks. U. S. Department of Agriculture, Forest Service General Technical Report RM-107. Fort Collins, CO: Rocky Mountain Range Experiment Station.

Riggin, S.H. and H.J. Hansen. 1992. Phase I Water Rental Pilot Project: Snake River Resident Fish and Wildlife Resources and Management Recommendations. U.S. DOE BPA Division of Wildlife and IDFG. 125 pps.

Robinson, A., Lower Valley Power and Light Company. 1996. Personal Communication.

Rupert, M. G. 1994. Analysis of Data on Nutrients and Organic Compounds in Ground Water in the Upper Snake River Basin, Idaho and Western Wyoming, 1980-91. USGS Water Resources Investigations Report 94-4135.

Saab, V.A. 1991. Area and Habitat Relationships of Breeding Birds in Cottonwood Gallery Forests Along the South Fork of the Snake River. Study No. 4202-1-7-1. U. S. Forest Service Intermountain Research Station. 27 pps.

_____. 1992. Area and Habitat Relationships of Small Landbirds Breeding in Cottonwood Riparian Forests Along the South Fork of the Snake River. Study No. 4202-1-7-1. U. S. Forest Service Intermountain Research Station. 48 pps.

_____. 1994. Habitat Use by Small Landbirds Breeding in Cottonwood Forests Along the South Fork of the Snake River. Boise, ID: U. S. Forest Service Intermountain Research Station.

_____. 1996. Influences of Spatial Scale and Land Use Practices on Habitat Relationships of Breeding Birds in Cottonwood Riparian Forests. Draft Ph.D Dissertation. Boulder, Co: University of Colorado. 140 pps.

Sather-Blair, S. and S. Preston. 1985. Wildlife Impact Assessment: Palisades Project, Idaho - Final Report. Project No. 84-37. Bonneville Power Administration and U.S. Department of Interior, Fish and Wildlife Service.

Schill, D. 1991. River and Stream Investigations. IDFG Job Performance Report, Project F-73-R-13.

Schrader, W.C., Idaho Department of Fish and Game. 1996. Personnel Communication.

Schrader, W.C. and R. G. Griswold. 1994. Winter Habitat Availability and Utilization by Juvenile Cutthroat Trout, Brown Trout, and Mountain Whitefish in the South Fork Snake River, Idaho. Idaho Department of Fish and Game, Project #0-AG-10-10920, Final Report.

Schroeder, R.L. and A.W. Allen. 1992. Assessment of Habitat of Wildlife Communities on the Snake River, Jackson, Wyoming. USFWS Resource Publication 190. 21 pps.

Smith, R., Planning Coordinator, Jefferson County. 1996. Personal Communication.

Solley, W. B., R. B. Pierce, and H. A. Perlman. 1993. Estimated Use of Water in the United States in 1990. U. S. Geological Circular 1081.

Sparling, W. C. 1974. *Southern Idaho Ghost Towns*. Caldwell, ID: The Caxton Printers, Ltd.

State of Idaho. 1975. Idaho Environmental Overview. Prepared for Id. Department of Water Resources, Id. Department of Health and Welfare, and Id. Department of Fish and Game.

Sutter, B. 1995. Upper Snake River (District 1) Rental Pool Summary - 1979-1995.

Swenson, J.E., K.L. Alt, and R.L. Eng. 1986. Ecology of Bald Eagles in the Greater

Yellowstone Ecosystem. *Wildlife Monographs*. Vol. 50, No.2, 46 pps.

Taul, J., Bonneville County Parks and Recreation. 1996. Personal Communication.

Tetlow, R.J. and S.R.J. Sheppard. 1980. Visual Unit Analysis: A Descriptive Approach to Landscape Assessment. In *Our National Landscape: Proceedings of a Conference on Applied Techniques for Analysis and Management of the Visual Resource*. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station. pps. 567-574.

Thurrow, R., Fisheries Biologist, Intermountain Research Station, U.S. Forest Service. 1996. Personal Communication.

Thurrow, R.F., C.E. Corsi, and V. K. Moore. 1988. Status, Ecology, and Management of Yellowstone Cutthroat Trout in the Upper Snake River Drainage, Idaho. *Am. Fish. Soc. Symp.* Vol. 4, pps. 25-36.

U.S. Army Corps of Engineers (CoE). 1981. National Hydroelectric Power Resources Study.

_____. 1988. Water Control Manual for Palisades Reservoir. Walla Walla, WA.

_____. 1995. Pacific Northwest Hydropower Database and Analysis System.

U. S. Bureau of Census. 1990. 1990 Census Data.

_____. 1993 *Statistical Abstract of the United States* (113th edition).

U. S. Department of Agriculture, Forest Service (Forest Service). 1974. National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System. Agriculture Handbook No. 462. Washington D.C.: U.S. Government Printing Office.

_____, Caribou National Forest. 1985. Land & Resource Management Plan and Final Environmental Impact Statement for the Caribou National Forest & Curlew National Grassland.

_____. Targhee National Forest. 1993. Draft Analysis of the Management Situation.

_____. 1995. Recreation Information Management System (RIMS) Reports.

_____. 1996a. Draft Environmental Impact Statement for Forest Plan Revision for Targhee National Forest.

_____. 1996b. Draft Forest Plan Revision for the Targhee National Forest.

U. S. Department of Agriculture, Soil Conservation Service (SCS). 1977. Irrigation Water Distribution and Use: Upper Snake River Basin - Idaho. Snake River Basin, Idaho and Wyoming Cooperative Study. M7-L-23421.

_____. 1979. Soil Survey of Jefferson County, Idaho.

_____. 1981a. Soil Survey of Bonneville County Area, Idaho.

_____. 1981b. Soil Survey of Madison County Area, Idaho.

_____. East Side Soil & Water Conservation District. 1994. Preliminary Investigation Report, Swan Valley Irrigation Project.

U. S. Department of Commerce, Bureau of Economic Analysis. 1996. Regional Economic Information System.

U. S. Department of Energy, Bonneville Power Administration (BPA). 1995. South Fork Snake River/Palisades Wildlife Mitigation Project - Final Environmental Assessment and Finding of No Significant Impact. DOE Document No. 0956. Logan, UT: BIO/WEST.

U.S. Department of Interior, Bureau of Land Management (BLM). 1986. Visual Resource Management Inventory and Contrast Rating Manuals - 8400 Series.

_____. Idaho Falls District. 1985. Medicine Lodge Proposed Resource Management Plan and Final Environmental Impact Statement.

_____. Idaho State Office. 1995. Recreation Management Information System (RMIS) Reports.

U.S. Department of Interior, BLM and U. S. Department of Agriculture, Forest Service (BLM and Forest Service). 1991. Snake River Activity/Operations Plan - Final. BLM-ID-PT-91-004-4410. 101 pps.

_____. 1991. Snake River Activity and Operations Plan - Environmental Assessment. BLM EA No. ID-030-0-36. 89 pps.

U.S. Department of Interior, Bureau of Reclamation (USBR). 1967. Jackson Lake Storage Replacement Reconnaissance Report.

_____. 1995. Statement of Power Production Fiscal Year 1995.

_____. 1996. The Upper Snake River Basin: A Description of Bureau of Reclamation System Operation Above Milner Dam.

U.S. Department of Interior, Bureau of Reclamation and U.S. Army Corps of Engineers (USBR and CoE). 1961. Upper Snake River Basin Summary Report - Vol. I and II.

_____. 1961. Upper Snake River Basin, Volume II, Land-Water-Flood Factors. Boise, ID.

U. S. Department of Interior, Fish and Wildlife Service. 1980. Important Fish and Wildlife Habitats of Idaho.

_____. 1986. Proposal to Fish and Wildlife Foundation, South Fork Snake River, Idaho. Boise, ID.

U. S. Department of Interior, National Park Service. 1987. National Natural Landmarks. Brochure.

U. S. Environmental Protection Agency (EPA). 1994. § 303(d) List for the State of Idaho, Decision document - October 7, 1994. Seattle, WA: U. S. Environmental Protection Agency.

_____. 1996. EPA Report, 303(d) List, April 2, 1996.

U.S. Geological Survey (USGS). 1965. Water Power Resources of Idaho.

_____. 1992. USGS Gage Stations, STORET Data.

_____. 1996. USGS Gage Stations, STORET Data.

Verner, Eric, Stream Channel Protection, Eastern Region, Idaho Department of Water Resources. 1995. Personal Communication.

Watson, D., Former Medicine Lodge Resource Area Manager, Bureau of Land Management. 1993. Personal Communication.

Whitfield, M. 1993. Idaho Bald Eagle Research Project - Greater Yellowstone Ecosystem - South Fork Snake River. Final Report. Report to U.S. Department of Interior, BLM; U. S. Department of Agriculture, Forest Service; IDFG; U. S. Department of Interior, Fish and Wildlife Service; and Northern Rockies Conservation Cooperative. 92 pp. + Appendices

Whitfield, M., Project Leader, South Fork Snake River, Idaho Bald Eagle Research Project. 1996. Personal Communication.

Willingham, Forest Archaeologist, Targhee National Forest. 1993 and 1996. Personal Communications.

Wirkus, Karl, Manager, Resources Management, U.S. Bureau of Reclamation. 1996. Personal Communication.

Wright, D. E., Regional Supervisor, Upper Snake Region, Idaho Department of Fish and Game. 1996. Letter of March 18, 1996 to Idaho Department of Water Resources.



APPENDICES

APPENDIX A: SOUTH FORK SNAKE ADVISORY GROUP

ADVISORY GROUP MEMBERS

Mark Bennion - South Fork Snake River canyon landowner
Dr. Steven Christensen - Ririe area landowner
Bill George - Blue Ribbon Coalition
Renell Weeks - Swan Valley area landowner
John Hill - Outfitters and guides
Ron Hover - Idaho Wildlife Council
Gerald Jeppesen - Madison County Commissioner
Tamar Jergensen - South Fork Snake Watershed Council
Theron McGarry - Grazing
Jon Ochi - Idaho Rivers United
Shaun Robertson / Chad Colter - The Shoshone-Bannock Tribes
Bill Shurtliff - Bonneville County Commissioner
Claude Storer - Irrigator / Committee of Nine
Kenneth Stromberg - Jefferson County Commissioner
Bill Terry - Trout Unlimited, Upper Snake River Cutthroats Chapter
Delbert Winterfeld - Dryland farmer / Soil Conservation Districts
Gerald Wolz - Private citizen / recreationist

SUMMARY OF SOUTH FORK SNAKE ADVISORY GROUP MEETINGS

The following summarizes the nine advisory group meetings held between June 1995 and June 1996. Attendance sheets and more specific information about each of these meetings is contained in IDWR files.

Meeting #1 - Monday, June 19, 1995; 7:00 - 10:00 p.m.; Ririe Lions Hall, Ririe, Idaho

The meeting began with introductions and review of material mailed to the South Fork Snake Advisory Group (SFSAG) earlier. The Idaho Water Resource Board (Board) and Idaho

Department of Water Resources' (IDWR) staff answered questions about the planning process and the Board's authority. The SFSAG and the two Board members present (Jerry Rigby and Dave Rydalch) signed a Letter of Acknowledgment. The letter formally recognizes the willingness of all SFSAG members to participate on the advisory group.

An Issue Summary list, containing a condensed version of all public comment, was reviewed. Issues were grouped into eleven categories. IDWR recorded comments about the issues on flipcharts. After discussing five of the eleven categories, the SFSAG decided to send comments about the remaining issue categories to IDWR by July 10. IDWR would compile a final issue list with items that the Board has control or authority to carry out highlighted. IDWR will mail this list to the SFSAG on July 10. The SFSAG would review this list, set priorities, and send back the prioritized list to IDWR by July 30.

Meeting #2 - Monday, August 28, 1995; 6:30 - 10:00 p.m.; Ririe Senior Citizens Center, Ririe, Idaho

This meeting focused on issues concerning water quality, fisheries, riparian management and wildlife. Four speakers were invited to present information to the SFSAG. They included Chris Mebane of the Division of Environmental Quality (DEQ), Bob Martin from the Idaho Department of Fish and Game, Mike Merigliano from the University of Montana, and Justin Naderman with the Idaho Department of Fish and Game.

Chris Mebane from the Eastern Region of the Division of Environmental Quality presented information on water quality. He described the results of a water quality study conducted September through October 1994 during

drawdown of Palisades Reservoir. In brief, the study concluded that state standards for turbidity and dissolved oxygen were not exceeded. Temperature parameters were exceeded. He also discussed water quality limited streams and reaches in the South Fork Snake River Basin. The South Fork Snake River in the basin is listed as a water quality limited reach because of reduced flows and not due to pollutants. Future actions of DEQ with respect to monitoring water quality segments were discussed in brief.

Bob Martin, Environmental Coordinator for Region 6 of the Idaho Department of Fish and Game, presented information on the fisheries. Habitat, recruitment needs, and comparison of growth rates of trout in the South Fork Snake River to other Idaho waterways were discussed. The importance of vegetation, and tributary and side channels for spawning were mentioned. Some discussion occurred about the threat of hybridization of cutthroat trout with rainbow trout, and disease.

Mike Merigliano, a research assistant with the University of Montana, discussed his research on cottonwood regeneration on the South Fork Snake River from Palisades Dam to Heise. Slides were presented depicting the historic development of cottonwood stands on the South Fork Snake River, and how this related to historic flood regimes before and after Palisades Dam.

Justin Naderman, Regional Wildlife Biologist with IDFG, summarized information about wildlife in the South Fork Snake River Basin. He first discussed bald eagle habitat requirements and the significance of the South Fork Snake River population, because it is the primary producer in the Greater Yellowstone Ecosystem. He discussed Canada geese and flow regime needs for successful reproduction. A flow of 8000 cubic feet per second is ideal with a constant flow Mid-May to March. Also noted were the important wintering habitat for elk, deer and moose, the presence of mountain goat and black bear in the basin.

After the presentations by the speakers, attendees were asked to submit strategies addressing the issues presented at this meeting.

Meeting #3 - Monday, November 6, 1995; 6:30 - 10:00 p.m.; Ririe Senior Citizens Center, Ririe, Idaho

The third South Fork Snake Advisory Group meeting focused on agency management & direction, growth & development, and recreation topics. A worksheet that summarized the top ranking issues for these topics was distributed. The worksheet's purpose is to provide a means for the advisory group and public to suggest strategies or solutions to address the wants/needs listed under each issue topic. A master list of all suggestions is being compiled and will be considered and refined by the SFSAG at a meeting in the Spring of 1996.

Summaries on other agency planning efforts occurring within the basin, existing and potential water development, and recreation information were distributed. A chart listing current planning efforts by other agencies within the basin was reviewed. This chart lists six major planning efforts currently occurring within the South Fork Snake River Basin, and four additional activities that include the basin. The scope, status, and contacts for these planning efforts were briefly discussed.

A "Suitable Timber" map was discussed. The map depicts areas that the Targhee National Forest have identified as technically capable and available to grow and harvest timber. A map depicting "Mines and Prospects" was described. A "Water Development" map was presented and a written summary distributed describing existing and potential water development. A "Land Development" map was described depicting all platted subdivisions located in the basin. Rhett Bradford, Mayor of the City of Irwin, spoke about land use development and its effects to the area.

Wade Brown, recreation planner with Bureau of Land Management, discussed recreation activity on the South Fork Snake River. He reviewed use statistics and recreation trends, river access, and impacts and monitoring. Ellen Berggren, from the Idaho Department of Water Resources, provided some additional information about recreation in the basin. Some information about regional recreation trends and use from studies conducted by University of Idaho in 1987 and 1993 were described. Estimates of recreation use by activity for each agency were reported. Some information on angler use and catch rates were reported for past years. Recent information is not available. Information on estimated hunters days was also presented. Number of clients serviced by the outfitting industry over the last five years were presented. A written summary of this information was distributed.

A listing of all strategies submitted to the Board to date were available for review at the meeting. Attendees were given the opportunity to add strategies to these lists during meeting breaks and at the end of the meeting.

Meeting #4 - Monday, January 22, 1996; 6:30 - 10:00 p.m.; Ririe Senior Citizens Center, Ririe, Idaho

The fourth South Fork Snake Advisory Group meeting focused on water quantity & allocation, irrigation, flood management, and operation of Palisades Dam. Mapped information addressing these topics was displayed for public review. Maps depicted irrigated and non-irrigated agricultural land in the South Fork Snake River Basin and the region, flood control district boundaries, canal company boundaries, and existing and potential water development projects.

Phil Rassier with the Attorney General's office talked about Idaho water law. His presentation included explanation of the following topics: the history and definition of the prior appropriation doctrine; allocation of water in times of shortages; definition of changes to water rights such as enlargement, transfers and expansions; losses of water rights; management

of groundwater and conjunctive management; explanation of the public trust doctrine and federal reserved rights; and the Snake River Basin adjudication. Mike Beus discussed operation of the Upper Snake System with a focus on Palisades Reservoir. He noted that there were several constraints that guided operation of the system. These included federal and state law, project authorizations, contracts with irrigators, and federal and state regulatory constraints including the Endangered Species Act.

A listing of all strategies submitted to the Board to date were available for review at the meeting. Attendees were given the opportunity to add strategies to these lists during meeting breaks and at the end of the meeting.

Meeting #5 - Monday, February 26, 1996; 6:30 - 10:00 p.m.; Ririe Senior Citizens Center, Ririe, Idaho

The main objective of the fifth South Fork Snake Advisory Group meeting was to review the evaluation of outstanding fish and wildlife, scenic and recreation resources conducted by the Idaho Department of Water Resources. First an explanation of why the Board needs to identify outstanding resource values was provided. Then the criteria used to determine outstanding resource values were presented.

Dave Gregor, aquatic biologist with the Department, described the biological evaluation. The biological evaluation reviewed available data about aquatic and riparian habitat and species, and the presence of crucial species and habitats. Ellen Berggren, water resources planner with the Department, described the recreation and scenic values evaluation.

After the presentations, people were invited to examine the maps and supporting documentation for the outstanding resource evaluations. Flip charts were also provided to offer additional suggestion for recommendations, actions or policies for inclusion in the South Fork Snake River Basin Plan.

Meeting #6 - Monday, March 25, 1996; 6:30 - 10:00 p.m.; Ririe Senior Citizens Center, Ririe, Idaho

The main objective of the sixth South Fork Snake Advisory Group meeting was to review and finalize the goals for the South Fork Snake River Basin, and evaluate the strategies compiled since August 1996. Based on the issues and concerns identified at past meetings a set of goals, or the desired future, were drafted. Goals listed under each of the eleven issue categories were reviewed and discussed by the group. Revisions were made to many so that all in attendance felt comfortable with them.

Next the South Fork Snake Advisory Group was given a twenty-five page list of strategies to evaluate. The list was compiled from suggestions received from the advisory group and public. The advisory group was asked to review all the strategies on the list and circle those they could not support as written. The purpose of this exercise was to identify strategies agreeable to everyone, and identify where conflict may exist. Those strategies that have group agreement will be presented to the Board for inclusion in the South Fork Snake River Basin Plan. Strategies where there is not agreement by the group will be discussed at the remaining meetings, determining if strategies can be revised so they are acceptable to all, or to suggest other ideas.

Meeting #7 - Monday, April 15, 1996; 7:00 - 10:00 p.m.; Ririe Senior Citizens Center, Ririe, Idaho

The seventh South Fork Snake Advisory Group meeting reviewed the final goals established for the South Fork Snake River Basin, and the results of the strategy evaluation that occurred at the previous meeting. First, the results of the strategy evaluation were briefly discussed. Advisory group members reviewed 245 strategies at the last meeting. They were to identify those they did not support as written. Of the 245 strategies reviewed, the advisory group agreed on about 9 percent of them. The group was close to agreement for another 30 percent of the strategies (only one or two individuals did not

support). About 32 percent of the strategies received moderate agreement (three or four individuals did not support). More substantial disagreement occurred for the remaining 30 percent of the strategies (five or more people did not support).

Planning staff at IDWR identified all the strategies where a consensus seemed close (disagreement by three or fewer advisory group members), grouping strategies with similar topics together. The advisory group reviewed and discussed each group of strategies, focusing on one group at a time. The process involved discussion of the strategies, suggestions for wording changes, or suggestions for new strategies. When the group felt comfortable with the final strategies, discussion moved to the next category.

Meeting #8 - Friday, May 17, 1996; 7:00 - 10:00 p.m.; Ririe Senior Citizens, Ririe, Idaho

The objective of the eighth South Fork Snake Advisory Group meeting was to make recommendations to the Board for natural or recreational river designations, and identify waterways for minimum streamflow study. Ground rules proposed to help the group work cooperatively were reviewed before beginning discussion about natural and recreational designations. The definition of a state natural or recreational river was briefly discussed, and the restrictions associated with each designation were described.

The advisory group discussed potential designations for Pine, Burns, Bear, and Big Elk creeks, and Warm Springs. These discussions resulted in agreement on several points. Since discussions for individual streams were taking a great deal of time, Ellen Berggren (Idaho Department of Water Resources) proposed reviewing the list of eligible streams to determine which did not have group support for designation. Based on the comments and discussion for the previous streams, Ellen would make a preliminary cut at specific designations for the streams selected by the group. This preliminary cut would be sent to the advisory group for their

review before submitting recommendations to the Board. This approach resulted in the group agreeing to designate all eligible streams with stipulations made for some waterways.

Discussion next addressed the issue of a minimum streamflow for the main stem South Fork Snake River. The discussion noted the legal constraints associated with operation of Palisades Dam, and the need to manage flows to meet contractual obligations to irrigators. Several suggestions were offered to meet contractual obligations to irrigators and attempt to achieve flows to maintain fisheries. Consensus was not reached on all items. The group then discussed and proposed minimum streamflow study for several tributaries to the main stem.

Meeting #9 - Monday, June 3, 1996; 7:00 - 10:00 p.m.; Ririe Senior Citizens Center, Ririe, Idaho

The final meeting's objective was to conclude discussions about the remaining strategy topics. The meeting devoted 20 minutes of discussion time to each of the following topics: water allocation, flood management, water development, operation of Palisades, riparian management, and water quality. Eight additional topics that did not deal with water management, but were indirectly related, remained. Individuals at the meeting were asked to rank the top two topics they would like to discuss. At the end of the meeting, the top ranked categories would be discussed using the time remaining. Recreation issues were ranked the highest by the group and were discussed in the time remaining.

The process involved discussion of the strategies, suggestions for wording changes, or suggestions for new strategies. When the group felt comfortable with the strategies, discussion moved to the next category. A final list of draft strategies/recommendations developed during advisory group meeting discussions was submitted to the SFSAG within the next two weeks, allowing one final opportunity to review them before they were submitted to the Board.



APPENDIX B: ISSUE SUMMARY

The following list was derived from comments provided by individuals attending public meetings held by the Idaho Water Resource Board from February 27 through March 2, 1995; a South Fork Snake Advisory Group meeting on June 19, 1995; and written comments. Eleven broad categories were identified. Individual comments were arranged under the appropriate category heading. Repetitious comments were grouped together and condensed to a single statement. The order of presentation does not indicate significance or importance of the issue.

Water Quality

- protect water quality of all tributaries
- accumulate data to allow monitoring and verification of water quality impacts
- minimize erosion through protection of natural vegetation and encouraging use of BMPs for all land uses
- establish cooperative agreements with landowners along the river to help protect water quality
- establish policy applicable statewide regarding flows outside the state and into the Lower Columbia (water quality and quantity)
- monitor and manage activities (float trip sanitation, development in corridor, livestock) potentially impacting water quality in basin to minimize water pollution
- water quality concerns from releases at Palisades Dam
- maintain water quality in a biologically beneficial condition when it leaves basin

Fisheries

- maintain a quality fishing experience
- minimum stream flows to maintain fishery year round
- protect areas where streams merge for fisheries
- protect fishery on South Fork from overuse

Riparian Management

- tax incentives for riparian improvements
- control noxious weeds along river using method safe for the water
- preservation of riparian vegetation in developed areas
- funds to help fence along the river
- maintain and enhance riparian visual corridor
- preserve and maintain cottonwoods -- flooding required for regeneration, use bank storage for cottonwood regeneration in years of excess water
- control bank erosion to protect natural vegetation

Wildlife

- protect wildlife habitat -- instream flows, cottonwood restoration/protection, eagle and geese nesting, canyon which is important to eagle
- concerns about beaver in some sections of the river and recommendations to transplant to others

- recognize the value of waterfowl, wildlife habitat and birds of prey
- maintain basin ecological integrity
- concerns about BPA wildlife mitigation plan

Recreation

- conflicts between motorized and non-motorized uses
- appropriate types and amount of recreation use on the South Fork Snake River
- maintain or improve access to river for recreation
- concerns about commercial outfitters
- safety concerns at the Big Feeder Diversion
- improved enforcement of violations
- long range recreation use management plan to address safety, sanitation, carrying capacity, and interpretive signs
- maintain quality outdoor recreation experience -- fishing, hunting, camping, hiking, rafting, and aesthetic values
- adjust releases from Palisades Dam to be in line with other uses (fish, wildlife and recreation)
- means to obtain current information on flows and predicted flows
- concerns about out-of-state demands for recreation resources
- need daily fees assessed to users or registration system
- determine impacts to recreation if Lynn Crandall storage reservoir were built
- manage for all recreation uses

- recreation users need to be courteous to each other
- policies pertaining to recreation uses should be general in nature

Development and Growth

- protect rural lifestyle and economy
- control subdivisions
- concerns about land uses and development along the river, particularly in the canyon, and associated impacts
- cooperative agreements with landowners along the river to help protect resource values
- establish setbacks for riparian corridor protection
- concerns about dams in canyon or on other reaches of the Snake
- concerns about impacts to private property rights
- existing mineral rights
- no additional boat ramps
- concerns about hydropower development
- concerns about timber sales
- need additional storage in the basin to store in high water years

Agency Involvement and Management Direction

- effects to private land ownership rights
- regulations with flexibility to apply to individual conditions at specific streams, not blanket regulations -- allow local input
- improved coordination between all agencies with responsibilities in the South Fork Snake River basin

- recommend formation of a group to coordinate with landowners regarding easements, etc.
- federal versus local control of resources
- concerns about BPA wildlife mitigation plan
- communication with all stakeholders facilitated and improved
- management decisions using the best available science
- form watershed council
- concerns about omitted lands and the outcome
- public education literature dealing with water and land use issues
- support and opposition to federal and state designations of rivers and streams

Water Quantity and Allocation

- maintain existing water rights, including instream livestock watering
- make water available for instream flows by changing water law to encourage water conservation or allowing changes from consumptive uses (irrigation) to non-consumptive instream uses
- investigate transfer of storage rights from Palisades Reservoir to ground water rights
- concerns about salmon flow augmentation
- federal versus local control of water
- prevent purchase of water rights where change in use may interfere with current practices
- develop policy applicable statewide regarding flows outside the state and into the Lower Columbia

- maintain a balance between all uses
- protect downstream users of water
- minimum stream flows suggested to benefit or maintain irrigation, fisheries, recreation, and wildlife
- develop policy on water spreading
- concerns about zero river flow

Operation of Palisades Project

- adjustment to flows and timing to meet the needs of irrigators, private property owners, fisheries, wildlife, cottonwood regeneration, and recreation
- improve communication of current and planned water releases out of Palisades Reservoir to all groups
- concerns about use of Palisades Reservoir water for salmon flush
- transfer surface water rights / storage at Palisades Reservoir for ground water rights
- use water bank storage for cottonwood regeneration in years of excess water
- increase volume and velocity of water between Palisades Dam to American Falls to prevent eutrophication in stagnant bays and coves
- recognize releases from Palisades Dam are determined by irrigation and flood management needs

Irrigation

- improve efficiency of irrigation to make water available for instream flows
- examine pressurized gravity irrigation system study conducted by SCS at Rainey and Palisades creeks
- irrigators need to communicate better with a better delineation of district boundaries

- allow continued access to the river for water rights diversions, maintenance and construction (point of diversion transfers)
- minimum stream flows or other recommended actions should not interfere with irrigation water rights
- improve water accounting responsiveness (weekend too long)

Flood Management

- concerns about future expansion of levees below Heise
- high water table causing flooding concerns in the Ririe and surrounding area
- survey from Palisades Dam to Heise to delineate highwater mark and existing floodplain
- flooding requirements for cottonwood regeneration



APPENDIX C: STRATEGIES CONSIDERED

BACKGROUND INFORMATION

The Idaho Water Resource Board (Board) identified eleven categories of issues through public meetings, written comment and discussion with the South Fork Snake Advisory Group (SFSAG). The SFSAG then ranked specific items under each issue category for importance and effort the group would like to expend in addressing these issues. The issues receiving a score of 30 or higher for effort were restated as a want or need. The SFSAG and public provided strategies or solutions to address wants and needs. A "strategy" is an action, policy or recommendation that would accomplish or implement the want or need. Attached is a list of all strategies received by the Board, and reviewed by the SFSAG. These represent alternatives considered for the South Fork Snake Plan. Not all strategies were forwarded to the Board as recommendations.

WATER QUALITY

WQ - WANT OR NEEDS:

Protect water quality of all tributaries.

Accumulate data to allow monitoring and verification of water quality impacts.

Monitor and manage activities in the river corridor potentially impacting water quality to minimize pollution.

Minimize erosion.

Maintain water in a biologically beneficial condition when it leaves the planning basin (confluence with the Henrys Fork).

SUGGESTED STRATEGIES:

1. Establish appropriate buffer zones along streams (to be established by qualified biologist) where logging will not occur.
2. Construct fences to keep livestock out of riparian areas in grazing allotments.
3. Establish zoning requirements to prohibit building in riparian areas.
4. Establish cooperative agreements with land owners along the river to protect water quality.
5. Accumulate data to allow monitoring and verification of water quality impacts. Measure water temperature, turbidity, oxygen, and presence of E. coli.
6. Encourage best management practices (BMPs) for all land uses.
7. Extensive studies need to be conducted now to determine the maximum concentration of dwellings that the land can support (by drainage). Link density of dwellings in a development to a level adequate to protect water quality. This information should be provided to the local planning authorities so development can be planned so as not to impact water quality.
8. Maintain minimum flows in streams (Streams should not be dewatered).
9. Recommend enabling legislation to allow communities to extract fees from new land sales to be used for future sewage systems.
10. Seek funding and identify additional drainages that could benefit from State Agricultural Water Quality Programs similar to those being implemented by the East Side Soil & Water Conservation District on agricultural land

in the Antelope and Granite creek watersheds. The programs are applying BMPs to reduce soil erosion. Goals of the projects are to treat 75 percent of the critical areas. Critical areas are non-irrigated cropland, all irrigated cropland with slopes exceeding 4 percent, and any concentrated feeding operations. These projects promote voluntary participation and local decision making.

11. Encourage all land owners to leave undisturbed strips along streams (both the main stem and tributaries). This will benefit landowners as well as the public, by preventing loss of acreage to erosion.

12. Encourage establishment of conservation easements for agricultural lands to prevent future development for other uses.

13. Educate homeowners about the sources of pollution harmful to aquatic life, i.e. lawn chemicals, septic tank discharge, automotive and household fluids, and siltation.

14. Investigate Conservation Reserve Program (CRP) and identify the incentives for farmers to reduce erosion. Incorporate these incentives into overall state water plan.

15. Keep homes 600' minimum distance from river and stream banks.

16. The Legislature should provide adequate funding to ensure that the Division of Environmental Quality can conduct an adequate program to monitor water quality in all streams where human activity has the potential to degrade water quality. Accumulate data to determine the source and sources of water contamination of rivers; and the amount and nature of contamination by sewage and animal waste.

17. All industrial and farming uses, and city and rural sewage systems should be monitored to ensure surface and drinking water is not contaminated by these uses.

18. Monitor canal water which may be contaminating well water.

19. Use funds collected through daily use permit system to allow a selected state agency, or to hire a private firm or contractor with a university or private foundation, to develop a monitoring program. This monitoring program could be developed by a graduate student as part of a Masters degree program. Eventually, other MS candidates could monitor the water quality and model the river ecosystem.

20. Water quality monitoring plan could include such actions as water sampling, BMP effectiveness evaluations, beneficial use assessments, and photo point sampling.

21. Impose requirements to pack out human waste anywhere on the South Fork Snake River.

22. Require frequent rotation of livestock in grazed areas along the main stem so that no part of the riparian area is overgrazed.

23. The following criteria should be considered in a holistic water quality program:

- water quality (flow rate, temperature, biological oxygen demand, chemical oxygen demand, oxygen content, organic content, pathogens)
- number of river users
- monitor irrigation withdrawals rates
- monitor low flow augmentation
- monitor activities that impact water quality (grazing, development along the river, etc.)
- monitor water fowl populations
- monitor eagle populations along the river
- monitor wildlife populations
- monitor fish (type, size, quantity)
- monitor water quality downstream, if any residential or grazing uses, to verify water quality

24. Development should have a minimum setback so that it is visually out-of-sight from the river channel.

25. Buffer zones should be established along the river and around the reservoirs to control erosion and minimize human impacts.

26. Run off from livestock pastures should be treated to some minimal standard before entering river.

27. In the canyon section of the South Fork Snake River (Conant - Black Canyon), provide public overnight toilets or designated toilet areas to minimize impacts of human waste.

28. Riparian vegetation should be protected and clear cutting should cease to be used as a forestry technique.

29. Increase education and enforcement to reduce erosion from off-road vehicle use.

30. Build sediment ponds in eroding tributaries.

31. Give tax incentives, grants or loans to landowners to repair badly eroded areas.

32. The Conservation Reserve Program (CRP) should be continued by the federal government.

33. Plant willows.

34. Establish riparian zone of at least 150 feet along the South Fork Snake River to help preserve aesthetics, wildlife and riparian values.

35. Encourage landowners to retain Conservation Reserve Program (CRP) lands in grass cover after contracts expire to reduce soil erosion.

36. State authorities should work with all entities to provide sufficient water to maintain water quality (flow rates, temperature and chemical standards) as it leaves the state sufficient to meet the needs of salmon/steelhead and other fisheries in the state.

37. Biologically beneficial condition should be defined as a condition suitable for the preservation of healthy populations of the native cutthroat trout.

38. DEQ should monitor the water quality for sediment, coliform bacteria, oxygen content, and identifiable agricultural chemicals.

39. Baseline and historic water quality data should be examined to determine if degradation has occurred. State authority should identify polluters and implement appropriate fines on responsible parties.

40. Establish monitoring site at the confluence to measure temperature, turbidity, oxygen content at each fork.

41. Encourage implementation of BMPs appropriate to the farming operation and needs to minimize soil erosion. BMPs may include:

- conservation tillage
- crop residue use/no till
- chiseling/subsoiling
- cross slope farming
- conservation cropping sequence
- pasture and hayland planting
- integrated pest management
- nutrient management
- planned grazing system
- fencing
- brush control
- spring developments
- pasture and hayland management
- strip cropping
- terrace and sediment basins
- grassed waterways
- windbreaks
- conservation cover (CRP)
- vegetative filter strips

42. Divide reservoir and river system into segments where different biological conditions can be maintained. The river system should not be managed as a single biological environment. (The reservoir should be allowed to maintain a different quality than the free-flowing river.) The river will be a cold water fishery and able to support cold water fish (trout). This will require a high dissolved oxygen level, low BOD/COD, low temperatures, and high flow rates. The reservoir on the other hand could be managed as a cool water fishery and allow fishing in shallow warm water for blue gill and bass and deep cold water fishing. Once the segments of the river system are defined, the basin will need to be monitored to ensure these segments are

maintained to beneficial use. The monitoring and enforcement will be funded through river use permit fees.

43. To maintain the beneficial conditions of the reservoir, the turbines of the Palisades Powerhouse need to be modified as will the irrigation intake structures to protect wildlife, fish and humans, etc.

FISHERIES

F - WANTS OR NEEDS:

Maintain a healthy cutthroat fishery.

Prevent over harvest of the fishery.

Maintain quality fishing experience.

SUGGESTED STRATEGIES:

1. The Water Plan should recommend as a goal that every stream in the basin be allocated a minimum streamflow adequate for the survival of its fisheries; the allocation should be approached through the voluntary transfer of water rights to instream use as, for example, increased efficiency allows irrigators to cultivate the same amount of land with less water.
2. A minimum flow should be maintained in all streams (Do not allow streams to be dewatered).
3. Minimum stream flows are needed on all trout spawning tributaries.
4. Establish a minimum streamflow of 1500 cfs at Lorenzo Bridge.
5. Strengthen the informal minimum flow agreement between U. S. Bureau of Reclamation and Idaho Department of Fish and Game.
6. A minimum flow of 2200 cfs is the lowest acceptable flow on the South Fork Snake River.
7. The Idaho Water Resource Board should pursue a minimum streamflow of 1500 cfs during the winter for the main stem South Fork Snake River from Palisades Dam to the confluence with the Henrys Fork to maintain a healthy fishery, and for the benefit of wintering and nesting bald eagles.
8. The Idaho Water Resource Board should pursue a minimum instream flow study on Pritchard Creek, and in five years recommend a minimum streamflow to protect fisheries and riparian habitat values.
9. The Idaho Water Resource Board should pursue a minimum instream flow study on Pine Creek, and in five years recommend a minimum streamflow to protect fisheries and riparian habitat values.
10. The Idaho Water Resource Board should pursue minimum streamflow studies for the most important tributaries, and in five years recommend a minimum streamflow to protect fisheries and riparian habitat on those tributaries. Accomplishing this action may be limited by funding over the next 5 years, and minimum streamflow studies may have to be prioritized. The highest priority tributaries needing flow protection include Pine Creek, Burns Creek, Warm Springs, Palisades Creek, Rainey Creek (headwaters to lower Targhee NF boundary), Pritchard Creek, Big Elk Creek, Fall Creek, McCoy Creek, Bear Creek, and Indian Creek (tributary to Palisades Reservoir).
11. For the main stem South Fork from Palisades Dam to the confluence with the Henrys Fork, flows should be maintained above 1,500 cfs during the fall and winter period (October 1 - March 30). The most important habitat for overwintering juvenile trout is in side-channels, which are most affected by flow reductions and fluctuations. The flow versus habitat relationship for fish (Schrader and Griswold 1994) indicates the greatest rate of loss of habitat occurs between 1,540 and 1,240 cfs. Of the weighted habitat available to subyearling cutthroat trout at 3,370 cfs, approximately one-third is lost as flows are reduced to 1,540 cfs, and over half is lost at 1,240 cfs. For brown trout, about half is lost at 1,540 and two-thirds at 1,240 cfs. Survival of

overwintering juvenile trout is critical to maintain the South Fork and tributary fisheries.

12. Acknowledge the importance of the South Fork Snake River as a nationally significant fishery.

13. Agencies with jurisdiction over the river perform their management duties with fisheries values in mind.

14. The Board should not micro-manage the IDFG role.

15. Maintain current catch rates and fishing regulations. (The quality of the fishing experience is a personal matter and should not be regulated. People will seek their own places and times according to their personal wants and needs. Overregulation impacts quality of the experience.)

16. Change fishing regulations to catch and release, no bait, and artificial lures only.

17. Water levels in the South Fork Snake River must be maintained between 2200 and 16,000 cfs.

18. Allow fishing all year round on the South Fork Snake River to avoid opening day crowds.

19. Two types of fishing activity in the South Fork basin -- reservoir and river. The entire watershed should be evaluated to determine the heaviest concentration of users and to limit users to a level to maintain a quality experience.

20. Catch and release only to increase number and size of fish.

21. Establish permit fees to maintain the fishing experience.

22. Change regulations to enhance size of fish below Swan Valley Bridge.

23. Manage the section below Poplar as a trophy fishing area. Require release of fish under 20 inches.

24. Improve catch rates by requiring release of everything between 12 and 20 inches.

25. Manage fishery as a wild cutthroat fishery.

26. Remove obstructions to free passage of fish where spawning tributaries enter the main stream.

27. IDFG should regulate fishing in areas where streams merge to protect spawners entering tributaries. Habitat should be protected and enhanced by local authority, BLM, Forest Service and counties.

28. IDFG should be encouraged to seek measures to prevent the imminent takeover of the cutthroats by rainbows. Genetic integrity of cutthroats is very important, discourage hybrids.

29. The river should be managed to emphasize production of cutthroat; other species are secondary. Minimize efforts to maintain brown trout since it is a non-native fish.

30. Remove slot limit on rainbow trout and hybrids, but maintain slot limit for brown trout.

31. Eliminate year round fishing below Heise.

32. Increase length limit to 17" or 18" minimum.

33. Reduce take home limit to one fish.

34. Eliminate bait fishing.

35. Have Id. Dept. Of Fish and Game determine the fish carrying capacity of the South Fork Snake River to determine the biological limit of people on the river. Study should answer the following questions: When are wildlife adversely impacted by the numbers of people? When is the fishery adversely impacted?

36. In times of drought with low flows that will harm fish, increase allowable harvest of fish.

37. Reduce fishing access on the river.

38. With existing regulations, over harvest does not appear to be a problem. As needed, IDFG can develop more-restrictive regulations. However, to safeguard against over harvest in the future, while providing for an increasing recreational demand, current trout habitat needs to be maintained, and overall habitat quality and quantity needs to be increased.

39. Catch and release all cutthroat trout.

40. Increase spawning habitat by protecting spawning tributaries and require fish screens in tributaries.

41. Stop the stocking of any ponds or streams in Idaho to stop the spread of whirling disease.

42. Conduct studies to determine how to prevent hybridization of the cutthroat and rainbows.

43. Fishery management should focus on protection of rainbow and brown trout, not just the cutthroats.

44. Reduce sedimentation into stream with improved farming practices to minimize harmful effects to salmonid eggs and fry.

45. Increase upper limit of the slot to 18".

46. Pritchard Creek provides potential spawning habitat for cutthroat trout from the South Fork Snake River. Designate Pritchard Creek as a state natural river from its source to the lower Targhee National Forest boundary. The following activities should be prohibited in the natural reach:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining;
- 5) Mineral or sand and gravel extraction within the stream bed; and
- 6) Alterations of the stream bed.

47. Designate Pritchard Creek a state protected recreational river from the lower Targhee

National Forest boundary to the confluence with the South Fork Snake. The following activities should be prohibited in the recreational reach:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining; and
- 5) Mineral or sand and gravel extraction within the stream bed.

Stream channel alterations shall be prohibited except those necessary to maintain and improve existing utilities, roadways, diversion works, fishery enhancement facilities and managed stream access facilities; for the maintenance of private property; and for public agencies to construct public access facilities and fishery enhancement facilities. In addition, new private stream access facilities may be allowed with Idaho Water Resource Board approval.

48. The Idaho Water Resource Board should pursue a minimum instream flow study on Pritchard Creek, and in five years recommend a minimum streamflow to protect fisheries and riparian habitat values.

49. Rainey Creek is an extremely important spawning tributary of the South Fork Snake River supporting cutthroat trout. Designate Rainey Creek as a state protected recreational river from its source to the confluence with South Fork Snake. The following activities should be prohibited:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining; and
- 5) Mineral or sand and gravel extraction within the stream bed.

Stream channel alterations shall be prohibited except those necessary to maintain and improve existing utilities, roadways, diversion works, fishery enhancement facilities and managed stream access

facilities; for the maintenance of private property; and for public agencies to construct public access facilities and fishery enhancement facilities. In addition, new private stream access facilities may be allowed with Idaho Water Resource Board approval.

50. Designate Pine Creek as a state protected natural river from the Targhee National Forest boundary to its mouth at the South Fork Snake. The following activities should be prohibited in the natural reach:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining;
- 5) Mineral or sand and gravel extraction within the stream bed; and
- 6) Alterations of the stream bed.

51. Designate Burns Creek as a state protected recreational river to protect important cutthroat trout spawning habitat.

52. The Idaho Water Resource Board should pursue a minimum instream flow study on Pine Creek, and in five years recommend a minimum streamflow to protect fisheries and riparian habitat values.

53. Pine Creek is an extremely important cutthroat trout spawning tributary for the South Fork Snake River. Designate Pine Creek a state protected recreational river from its source to the county road just below Highway 31 bridge as the lower Targhee National Forest boundary. The following activities should be prohibited in the recreational reach:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining; and
- 5) Mineral or sand and gravel extraction within the stream bed.

Stream channel alterations shall be prohibited except those necessary to maintain and improve existing utilities, roadways, diversion works, fishery enhancement facilities and managed stream access facilities; for the maintenance of private property; and for public agencies to construct public access facilities and fishery enhancement facilities. In addition, new private stream access facilities may be allowed with Idaho Water Resource Board approval.

54. The South Fork Snake River possesses outstanding fish and wildlife values including unique, diverse cottonwood gallery forest, blue ribbon native trout fishery, and nesting and wintering bald eagles. Designate the South Fork Snake River from Palisades Dam to the Conant Valley power line as a state protected recreational river. The following activities should be prohibited on the recreational reach:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining; and
- 5) Mineral or sand and gravel extraction within the stream bed.

Stream channel alterations shall be prohibited except those necessary to maintain and improve existing utilities, roadways, diversion works, fishery enhancement facilities and managed stream access facilities; for the maintenance of private property; and for public agencies to construct public access facilities and fishery enhancement facilities. In addition, new private stream access facilities may be allowed with Idaho Water Resource Board approval.

55. Designate the South Fork Snake River from Conant Valley power line to the Riley Diversion as a state protected natural river. The following activities should be prohibited on the natural reach:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining;

- 5) Mineral or sand and gravel extraction within the stream bed; and
- 6) Alterations of stream bed.

56. Designate the South Fork Snake River from the Riley Diversion to the confluence with Henrys Fork as a state protected recreational river. The following activities should be prohibited on the recreational reach:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining; and
- 5) Mineral or sand and gravel extraction within the stream bed.

Stream channel alterations shall be prohibited except those necessary to maintain and improve existing utilities, roadways, diversion works, fishery enhancement facilities and managed stream access facilities; for the maintenance of private property; and for public agencies to construct public access facilities and fishery enhancement facilities. In addition, new private stream access facilities may be allowed with Idaho Water Resource Board approval.

57. The principal threat to the future of the South Fork Snake River fishery is habitat quantity and quality. IDFG manages the entire South Fork Snake River as a wild trout fishery. Therefore, the river fishery depends on spawning access to tributaries, recruitment of juveniles back to the river, and survival of juveniles through the fall and winter period. If the river and tributary fisheries are to be maintained or improved to accommodate an increasing recreational demand, the following habitat-related objectives are needed :

- Ensure fish passage between the tributaries and main stem;
- Maintain or improve water quality;
- Provide adequate flows in the main stem and tributaries to support a healthy fish community;
- Protect and enhance riparian vegetation conditions;
- Install screens at diversions, where feasible;

- Install fish passage facilities at man-made barriers, where feasible;
- Protect riparian and riverine habitats from the following: construction or expansion of dams or impoundments; construction of hydropower projects; construction of water diversion works; dredge or placer mining; alterations of the stream bed; and mineral or sand and gravel extraction within the stream bed.

RIPARIAN MANAGEMENT

RM - WANT OR NEED:

Preserve riparian vegetation in developed areas.

SUGGESTED STRATEGIES:

1. Encourage homeowners to leave willows, cottonwoods and other native vegetation in place along the stream banks as opposed to manicured lawns, etc.
2. Zoning requirements should be imposed to prohibit removal of vegetation within a buffer zone along the river/streams, and prohibit construction in riparian areas.
3. Investigate the feasibility of floods for cottonwood regeneration of 30,000-40,000 cfs every 20 years. If impractical, promote planting of cottonwoods.
4. Give preservation of cottonwood forest an extremely high priority, because of its significance as an ecosystem.
5. Minimize construction of new roads in riparian corridor.
6. Discourage development on the floodplain.
7. Promote education of the importance of cottonwood regeneration.
8. Local authorities need to develop regulations to maintain native vegetation in riparian corridor (cottonwood areas), and streams and sloughs in their natural state. This may be accomplished by

limiting development and requiring developers or residences to be setback from the river so that they are not visible from the river.

9. Flood flows are not feasible for cottonwood regeneration. Protection of cottonwood vegetation should be achieved by regulation from local authorities and re-planting.

10. Plant cottonwoods in and around mature stands.

11. Fence all livestock from cottonwood forests and riverbanks.

12. Utilize a "flood stage" flow level of 35,000 + cfs every 10 years to flush the system and to encourage cottonwood regeneration.

13. Require flood insurance for new houses built in the 100-year floodplain to discourage construction in the riparian zone and to prevent damage to property during floods. It would also reduce the need for state-federal matching funds to save people who build in the floodplain.

14. Educate landowners about the opportunity to obtain loans and grants from the SWCDs (through the Idaho Soil Commission) for range and riparian improvements.

15. Delineate the zone of land affected by flows of 30,000 to 35,000 cfs needed to regenerate cottonwood. Prohibit development impacted by flooding in these zones.

16. Recommend to County Planning and Zoning Commissions that future development should only be permitted when located outside of sensitive areas, including river shorelines.

17. Provide tax incentives for leaving riparian areas undeveloped or improving riparian habitat.

18. The South Fork Snake River should be designated as a National Wild and Scenic River from Conant Valley to Black Canyon to preserve the cottonwood forest, considered one of the most ecologically important riparian area in Idaho.

19. All private property from Conant Valley to Black Canyon should be purchased to protect cottonwood forest.

20. Hire the services of experts in planting cottonwood to determine the feasibility and expense of planting.

21. Discourage construction in riparian zones to protect riparian habitat. Promote setbacks, conservation easements, and other appropriate legal techniques.

WILDLIFE

W - WANTS OR NEEDS:

Maintain wildlife habitat.

Recognize the value of waterfowl, wildlife habitat and birds of prey

Maintain basin ecological integrity.

SUGGESTED STRATEGIES:

1. River use should be limited or excluded in critical goose nesting areas during critical times (March through May) to prevent disturbance. The primary nesting areas would be Rainey Creek to Conant Valley and Heise Bridge to the Henrys Fork confluence.

2. Maintain river flows above 1500 cfs to benefit eagles by preventing ice buildup and enhancing food supply.

3. Control noxious weeds which displace native vegetation and reduce the productivity of the habitat. Promote biological control, as opposed to chemical control, to achieve these objectives and protect water quality. Educate landowners about this opportunity to control noxious weeds through the South Fork Biological Weed Control Committee.

4. Address grazing pressures from the elk herds.

5. Manage predators such as cougar, coyote, foxes, etc. to improve pheasant and quail populations.

6. For the main stem South Fork from Palisades Dam to the confluence with the Henrys Fork, maintain flows above 1,500 cfs during the fall and winter period (October 1 - March). Bald eagle productivity depends on the condition of birds following winter, as well as the foraging conditions during the nesting period, which begins on approximately February 1. The bald eagles that nest in the basin tend to winter on the South Fork. Winter low flows that lead to extensive ice-over for extensive periods of time reduce the productivity of nesting bald eagles during the summer following the low flows and extensive icing conditions.

7. Pritchard Creek and its supporting riparian habitat provides habitat for large numbers of big game. Designate Pritchard Creek as a state natural river from its source to the lower Targhee National Forest boundary. The following activities should be prohibited in the natural reach:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining;
- 5) Mineral or sand and gravel extraction within the stream bed; and
- 6) Alterations of the stream bed.

8. Designate Pritchard Creek a state protected recreational river from the lower Targhee National Forest boundary to the confluence with the South Fork Snake. The following activities should be prohibited in the recreational reach:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining; and
- 5) Mineral or sand and gravel extraction within the stream bed.

Stream channel alterations shall be prohibited except those necessary to maintain and improve existing utilities, roadways, diversion works, fishery enhancement facilities and managed stream access facilities; for the maintenance of private property; and for public agencies to construct public access facilities and fishery enhancement facilities. In addition, new private stream access facilities may be allowed with Idaho Water Resource Board approval.

9. Protect and enhance wildlife habitats, especially wetlands and big game winter ranges by minimizing development in these habitat areas. The main stem river corridor and adjacent lands are crucial winter habitat for many wildlife species. New developments in big game winter range would reduce the size of big game populations and the associated recreational hunting and observing opportunities.

10. Minimize impacts of livestock grazing, logging, road construction, and farming through implementation of best management practices.

11. The more rare species, or those of significance to users of the river corridor, should be given specific recognition, including the bald eagle, peregrine falcon, geese, moose, bears, elk, and cutthroat and brown trout.

12. Install information posters at the put-in to warn people about harassing or disturbing birds (especially bald eagles) and other wildlife.

13. Maintain a buffer zone of several hundred feet above highwater to maintain wildlife and waterfowl habitat.

14. Maintain CRP lands in grass cover to maintain important wildlife habitat.

15. The Idaho Water Resource Board should pursue a minimum streamflow of 1500 cfs during the winter for the main stem South Fork Snake River from Palisades Dam to the confluence with the Henrys Fork to maintain a healthy fishery, and for the benefit of wintering and nesting bald eagles.

16. Ecological integrity will be achieved by implementing actions to maintain water quality and limit development.

17. No development should be allowed in the canyon.

18. Designate canyon as Wild and Scenic River with all land being managed by the Forest Service and BLM.

RECREATION

R - WANTS OR NEEDS:

Maintain quality of the outdoor recreation experience.

Maintain quality of the fishing experience.

Adjust flows from Palisades Dam to be more favorable to the needs of the fishery, wildlife and recreation while accomplishing irrigation, flood control and power generation objectives.

Improve safety at the Big Feeder for boaters.

SUGGESTED STRATEGIES:

1. Maintain the current number of outfitters and legally outfitted trips on the South Fork Snake.
2. Establish zoning to address conflicts between motorized and non-motorized users.
3. Establish horsepower limits for motorized use.
4. Encourage proper boating etiquette.
5. Address law enforcement concerns in the Swan Valley and Irwin areas from increased recreation use.
6. Log dead and downed timber to prevent catastrophic fires in the future, and improve the recreation experience.
7. Prohibit jet skis on the South Fork Snake.
8. Allow outboard motors less than 100 HP

9. Recommend a no wake law for motors. Speed limited to 5 mph.

10. No private homes in the canyon section. The Federal government should make land exchanges for all private land in the canyon.

11. Do not improve the Snake River Road.

12. Restrict certain types of motorized crafts to designated segments of the river and/or to specified days of the week.

13. Legislation needs to be passed allowing heavier fines and strict enforcement of outfitter and guide regulations to prevent illegal outfitting. For example, allow confiscation of property in addition to monetary fines.

14. Restrict access to levees by recreationists. Maintain limited access between Heise and the Henrys Fork confluence at Twin Bridges, Labelle area, and Annis area.

15. Reconstruct bridges located on Rainey Creek washed out in the spring of 1984.

16. Provide additional parking and camping at Palisades Creek Campground.

17. Cress Creek offers one of the most impressive environmental education opportunities for the South Fork Snake River corridor, being a short driving distance from Idaho Falls. Designate Cress Creek as a state protected natural river along its entire reach. The following activities should be prohibited:

- 1) Construction or expansion of dams or impoundments;
- 2) Construction of hydro projects;
- 3) Construction of water diversion works;
- 4) Dredge or placer mining;
- 5) Mineral or sand and gravel extraction within the stream bed; and
- 6) Alterations of the stream bed.

18. The Idaho Water Resource Board should obtain a minimum streamflow for Cress Creek.

19. More enforcement people at the access points on the river.
20. Regulate general public on the river.
21. Limit motorized use to the reservoir. Only non-motorized use below Palisades Dam.
22. State of Idaho to administer a permit system that would give outfitters and guides no more than 50 percent of permits, and requiring limited number of permits for day use floaters.
23. Do not implement a permit system.
24. Limit number of boat launchings each hour during heavy use months (July).
25. Change the Outfitter and Guides Licensing Board rules to limit the use of out-of-state guides by outfitters to minimize illegal guiding.
26. Restrict development to 500 feet from the river bank.
27. Prohibit development in the canyon section (Conant to Black Canyon).
28. Agencies managing recreation should conduct a study to determine the physical and social recreation carrying capacity of the South Fork Snake River corridor.
29. Implement a program to help various recreation users resolve conflicts and learn to respect each other.
30. Determine how Lynn Crandall would impact the cutthroat fishery.
31. Determine if there is enough unappropriated water to justify Lynn Crandall.
32. Determine the demand for reservoir versus free-flowing river recreational experiences.
33. Determine the impacts to summer and wintering habitat for wildlife species if Lynn Crandall were proposed.

34. The entity undertaking measures to improve safety at the Big Feeder needs to consider minimum safety standards, and may assume responsibility for future liability and maintenance or upgrade.

35. Maintain the current number of developed river access points.

36. Maintain the Snake River Road at its current level of development. Allow only minor improvements for safety and maintenance.

DEVELOPMENT & GROWTH

D - WANTS OR NEEDS:

Minimize or prevent adverse effects from development along the river corridor, particularly the canyon.

Protect private property rights.

SUGGESTED STRATEGIES:

1. Limit development in the canyon to maintain wilderness qualities.
2. Do not allow visible development on canyon rim.
3. Place a moratorium on development along the river.
4. Establish a buffer zone several hundred feet from the highwater level.
5. Development should use best available management of its wastes. Eliminate septic/drain fields. All waste water should be transported out of the river valley for treatment. Or new secondary treatment should be required for all new development.
6. Encourage the practice of "conservation development" along the river corridor. Build as far from the river as possible, in the least sensitive areas, and do not remove vegetation along the river.

7. Development should be set back a minimum of 75 to 150 feet to protect aesthetic values. This buffer should include leaving the natural vegetation in place, unaltered.

8. Require subdivision/development applicants to provide a site-specific habitat conservation plan, including a plan to protect nesting and foraging bald eagles.

9. Permit development only if they are at least $> \frac{1}{2}$ mile from bald eagle nests and not in identified principal management parcels.

10. Require developments to retain all trees along shorelines for fish and wildlife, including bald eagle perch and nesting trees.

11. Require sufficient construction setbacks from shorelines to protect visual values.

12. Require developments to retain sufficient native vegetation on shorelines (no mowing, burning, spraying, cutting, etc.) to protect shoreline stability, water quality, fish and wildlife habitat, and visual values.

13. Approve preliminary plats only after approved wetland mapping is complete.

14. Grant building permits only in uplands existing at the time of preliminary plat approval.

15. Permit clustering outside wetland and shoreline areas only.

16. Permit no further subdivision of platted lots.

17. Require developments to retain streams and streambeds (bridges only; no culverts or filling).

18. Permit future development when they are outside of sensitive areas, including river shorelines.

19. The option to build future water development projects should be preserved (for example Lynn Crandall/Burns Creek storage reservoir) .

20. The Palisade and Rainey Creek project placing irrigation water in a pipe, should only be considered if both creeks are developed jointly.

There is normally not enough water in Rainey Creek during normal irrigation season to take care of the farmers, even with the reduced requirement, and still leave enough water to keep from drying up the creek. If the systems from both Rainey and Palisade creeks were tied together that would not be a problem.

21. The main stem and important tributaries should be protected from water storage projects and hydropower generation projects.

22. Provide additional storage in the Upper Snake to store water in high water years.

23. Establish cooperative agreements with landowners along the river to help protect resource values.

24. Require public comment for all proposed changes in land and water use associated with the South Fork Snake River corridor.

AGENCY INVOLVEMENT & MANAGEMENT DIRECTION

AM - WANTS OR NEEDS:

Management decisions should use the best available science.

Improve agency coordination in managing the resources in the South Fork Snake River basin.

SUGGESTED STRATEGIES:

1. Manage the river according to the direction established in the *Snake River Activity and Operations Plan*.

2. State agencies should coordinate with the U.S. Bureau of Reclamation, debating state rights versus federal rights will not resolve issues.

3. Support implementation of the Bonneville Power Administration's wildlife mitigation plan.

4. Establish a group to coordinate with landowners and agencies, and to resolve conflicts.

5. Form a watershed council for the South Fork Snake River basin.

6. Based on the evaluation of outstanding resource values identified in the South Fork Snake basin. Designate the following reaches as state protected rivers:

- Bear Creek, headwaters to Palisades Reservoir;
- Big Elk Creek and headwaters, state line to Palisades Reservoir;
- Burns Creek, headwaters to South Fork Snake River;
- Cress Creek, headwaters to its sinks;
- Dry Canyon, mouth of Waterfall Canyon to Palisades Creek (includes Upper Palisades Lake);
- Fall Creek, headwaters to South Fork Snake River;
- Indian Creek (reservoir trib) and headwaters, state line to South Fork Snake River;
- Indian Creek (main stem trib), headwaters to South Fork Snake River;
- McCoy Creek, headwaters to Palisades Reservoir;
- Palisades Creek, headwaters to South Fork Snake River;
- Pine Creek, headwaters to South Fork Snake River;
- Pritchard Creek, headwaters to South Fork Snake River;
- Rainey Creek, headwaters to South Fork Snake River;
- South Fork Snake River, state line to Henrys Fork confluence; and
- Waterfall Canyon, headwaters to Dry Canyon Creek confluence.

7. Evaluate and protect as state protected rivers the following stream reaches:

- Warm Springs (tributary near Burns Creek), headwaters to South Fork Snake River;
- Little Elk Creek, headwaters to Palisades Reservoir;
- Wolverine Creek, headwaters to South Fork Snake River;
- Black Canyon Creek, headwaters to South Fork Snake River

- Trout Creek, headwaters to Palisades Reservoir.

WATER QUANTITY AND ALLOCATION

WA - WANTS OR NEEDS:

Maintain a balance between all water users.

Change water law to allow greater flexibility in allocating water to different uses and address the changing demands for water in the basin and state.

SUGGESTED STRATEGIES:

1. Buy existing water rights from canal companies that have lost farms due to development.
2. Establish policy for water spreading. (Additional water is being supplied to previously irrigated acres because conversion of flood to sprinkler irrigation has made additional water available.)
3. Water from Idaho should not be used for "flow augmentation" to flush salmon smolts. Successful outmigration of salmon smolts requires that conditions in the lower Snake and Columbia Reservoir system be essentially river-like and not lake-like. These conditions cannot be achieved without substantial drawdowns of these reservoirs in the lower Snake and Columbia rivers.
4. Restrict pumping from the aquifer to compensate for reduced irrigation water from the Snake River.
5. Make water available for instream flows by changing water law to encourage water conservation, or allowing changes from consumptive uses (irrigation) to non-consumptive instream uses.
6. Establish priorities for the use of water during low water years between the different uses -- irrigation is first (by law) down to a minimum streamflow; then fisheries and water quality take priority; fisheries have priority over recreation.

7. Investigate current aquifer recharge policy and establish clear objectives for the recharge program. Determine appropriate areas in the Snake River Plan aquifer to apply recharge water to accomplish these objectives.

8. Prevent purchase of water rights where change in use may interfere with current uses.

9. Transfer storage rights from Palisades Reservoir to ground water rights.

10. Water management policy should consider the effects of these policies and protect downstream users of water, including users outside the basin.

11. Increase instream flows by giving incentives to water rights holders to be more efficient, i.e., allow water right holder to keep 50 percent of the water that he saves by using more efficiently his water. The other 50 percent would be required to go to instream use.

12. Recommend that the law be changed to allow transfers on a voluntary basis.

OPERATION OF PALISADES RESERVOIR

PR - WANT OR NEED:

Adjust flows and timing from Palisades Reservoir to meet the needs of irrigators, flood management, private property owners, fisheries, wildlife, cottonwood regeneration, and recreation.

SUGGESTED STRATEGIES:

1. Release water early enough from Palisades and Jackson to keep the flow less than 18,000 cfs during July.

2. Provide high enough flows to regenerate cottonwood in April and May during years when high runoff is expected. The flows could be short in duration and at a safe controlled level -- less than one week at 30,000.

3. Reexamine the flood control curves used to determine releases in the Upper Snake projects. Calculate new flood control curves integrating flows needed for fisheries, recreation, and wildlife and riparian habitat, in addition to irrigation and flood control.

4. Improve communication of current and planned water releases from the Upper Snake to all water users by establishing a prerecorded message accessible to the public.

5. Water accounting response needs to be improved to allow communication and action on weekends.

6. Develop a predictive model that regulates changes in river flows based on precipitation records for the year and biological needs of fish (spawning and winter minimum flows). Regulate the changes to minimize impacts on life cycles of the resident fish population.

7. Adjust flows from the Dam to meet the needs of the fish. Maintain a minimum flow from the Dam established by comparing 10-15 percent of the mean annual flow with minimum streamflow studies conducted by IDFG. Support irrigation needs as long as minimum flow is maintained.

8. Work on any and all compromises to achieve flow rates to better balance wildlife needs.

9. Provide flow releases from Palisades Dam of at least 1,500 cfs during fall and winter for fishery.

10. Establish ramping rate protocols for normal Palisades Dam operation.

11. When sufficient water is available, provide periodic releases from Palisades Dam of sufficient amount and duration to facilitate cottonwood seedling establishment to perpetuate the stands.

12. Manage reservoir levels to avoid large flow increases immediately before, or during, the fishing opener and 4th of July weekends.

13. Manage Palisades flows and Big Feeder diversions to maintain adequate flows in the South Fork below the Big Feeder.

14. Maintain Palisades Reservoir at a level adequate to absorb the 50-100 year flood without increasing the river flow rates above 100-150 percent of the annual mean average flow.

15. Many consider it feasible to develop 75-90 percent of the mean annual flow of a river (Clark, Viessman, and Hammer). The minimum streamflow should be defined as 10-25 percent of the mean annual flow; however, this value needs to be confirmed by actual basin data. The minimum flow should be maintained and not decreased unless severe drought conditions exist for extended periods. The volume of flow may be increased under flood conditions.

16. When sufficient water is available, manage Palisades releases to improve Canada goose nesting success: 8,000 to 16,000 cfs releases during the nesting season (March-May). The recommended flow reduces predator access to nesting islands, while preventing inundation of the important islands. Parker (1973) and DeShon (1976, 1977, 1978) found a significant reduction in nest attempts and success at flows < 5,000 cfs; and they found significant nesting island inundation at flows > 18,000 cfs. The recommended consistent high flows cause Canada geese to initiate nesting far enough uphill to reduce their vulnerability to nest flooding later during their nesting attempt.

IRRIGATION

I - WANT OR NEED:

Improve irrigation efficiency to make water available for instream flows.

SUGGESTED STRATEGIES:

1. Determine the availability of water from transfer of irrigated land to other uses.
2. Pursue and establish a policy about water spreading.

3. Provide incentives to convert from flood irrigation to sprinkler and/or lining of ditches and canals.

4. Quantify how improved efficiency effects aquifer recharge, and flows at wells and springs.

FLOOD MANAGEMENT

FM - WANT OR NEED:

Address future flood management in the South Fork Snake River basin, including the future of levees below Heise.

SUGGESTED STRATEGIES:

1. Raise levees to accommodate recommended flows for cottonwood regeneration.
2. Areas currently protected by levees should remain free of residential development or significant structures.
3. Reassess the 100-year floodplain and delineate it based on current operation of the Upper Snake projects.
4. Prohibit construction of new or expansion of existing levees and dikes along South Fork Snake River which will constrict the river, reduce the floodplain, lead to more severe flooding downstream, further encroachment on the floodplain by development, and impact wildlife and aesthetic values.
5. Increased flood control will also accelerate the rate of loss of the cottonwood community.
6. Prior to permitting additional dikes, levees, and riprap projects, the situation on the South Fork Snake River in Wyoming should be understood, and it should be avoided on the South Fork in Idaho. (Fish and wildlife habitat, and associated recreational opportunities, may be permanently degraded as a result of dikes, levees, and riprap projects.)
7. Release flood flows from Palisades Dam as necessary to re-establish wetlands in areas that

have been converted to uplands as a result of flood control.

8. Study options to address the high water table and flooding concerns in Ririe and surrounding areas.

9. Survey from the dam to confluence with Henrys Fork to delineate the highwater mark and floodplain.

